Early Recognition and Management of Sepsis

Post-acute Settings

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Overview

- Why sepsis? Why now?
- Post sepsis syndrome
- A collaborative approach to improving sepsis care at SNFs
  - Early identification and management of sepsis at SNF
  - Infection Prevention of PNA, UTI and CLABSI
- Sepsis toolkit for Post-acute Setting

Faces of Sepsis

- https://www.youtube.com/watch?v=12Qbnn6XfH0

Sepsis.org

Sepsis Survivor Story: Steve

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Sepsis is an Epidemic

- Affects >1 million Americans per year
- 3rd leading cause of death in the US
- Sepsis occurs in just 10% of U.S. hospital patients, but it contributes to as many as half of all hospital deaths
- US spends $24 billion per year to treat

> 700 people die each day from sepsis in the U.S.- one every 2 minutes

1.Sands KE, Bates DW, Lanken PN, et al. Epidemiology of sepsis syndrome in 8 academic medical centers. *JAMA* 1997;278:234-40.

2. National Vital Statistics Reports. 2005.
3. Angus DC, Linde-Zwirble WT, Lidicker J, et al. Epidemiology of severe sepsis in the United States: analysis of incidence, outcome and associated costs of care. *Crit Care Med* 2001;29:1303-10.
4. AHRQ: accessed 06/27/2016 http://www.healthcarefinancenews.com/news/septicemia-newborn-care-top-list-most-expensive-treatments-agency-healthcare-

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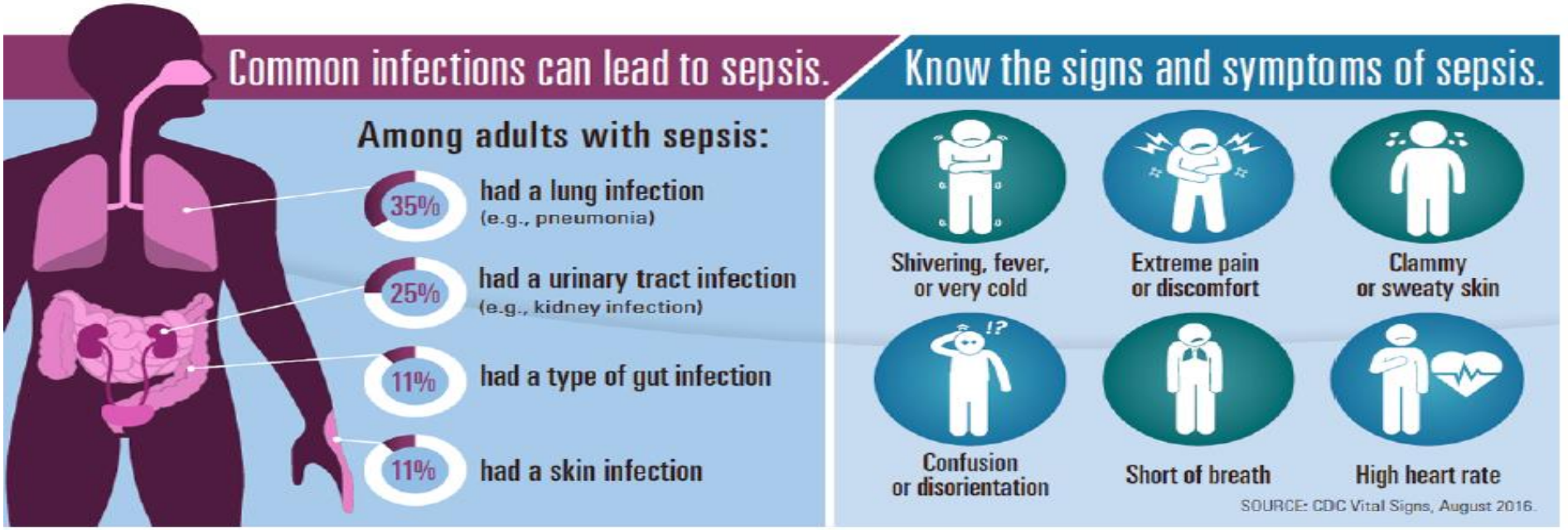
Sepsis: CDC Vital Sign

https://www.cdc.gov/vitalsigns/sepsis/August 2016



- 80% of sepsis begins outside the hospital
- 7 out of 10 patients with sepsis had recently used health services or had chronic dx requiring frequent care
- 4 types of infections most connected to sepsis; lung, urinary tract, skin and gut
- **HCP: think sepsis & act fast**

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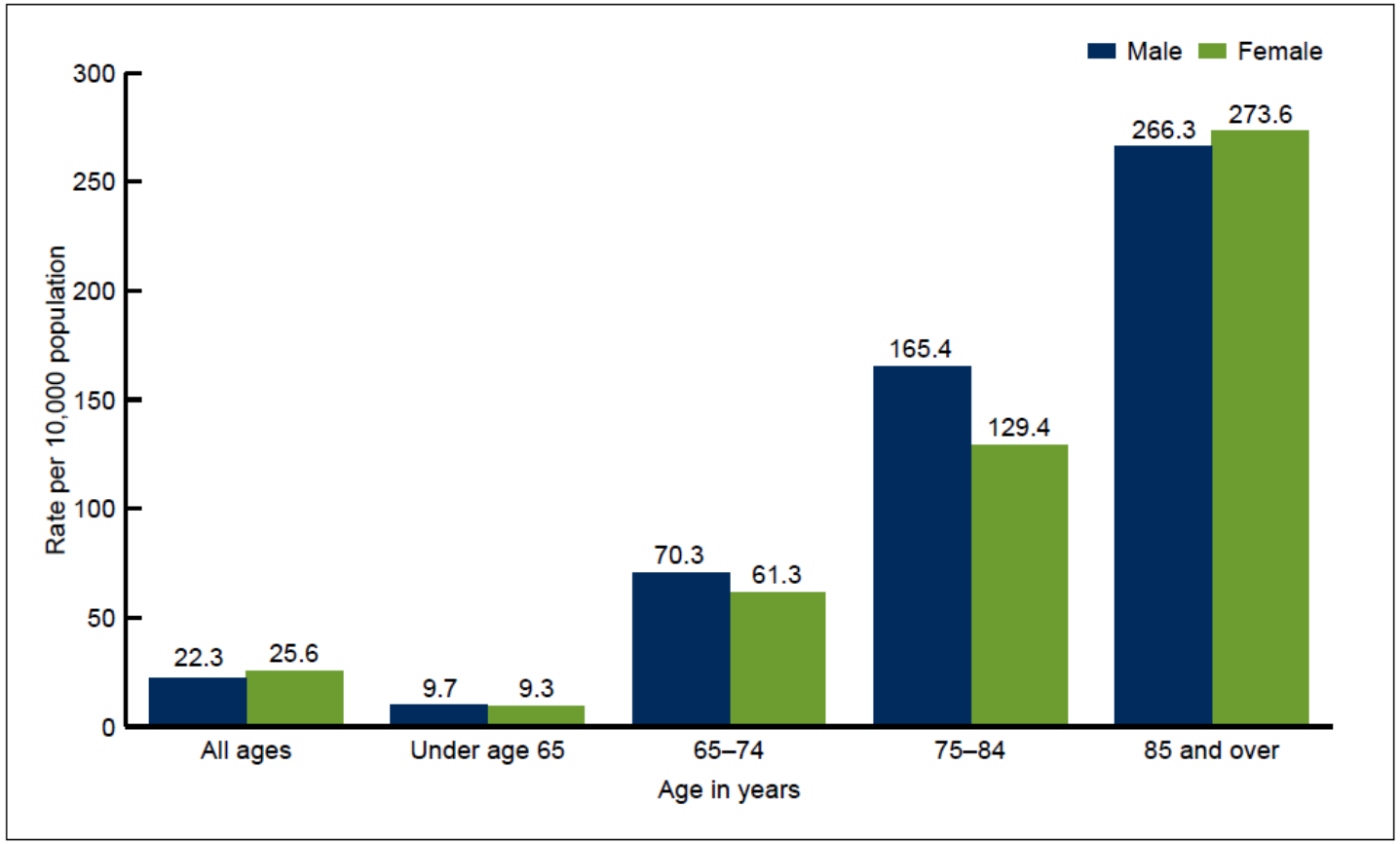
Sepsis Awareness

study done by Sepsis Alliance annually

- Sepsis awareness has significantly increased at 58% over 55% in 2016.
  - This means more than 7 million more adults are aware of sepsis in 2017 compared to 2016
  - Those under 45 are significantly more likely to have heard the term sepsis than over (62% vs. 53%)
- Almost one-quarter of Americans believe that sepsis only happens in hospitals (23%)
- An alarming 39% of Americans believe that sepsis is contagious
- Nearly three-quarters of Americans say they can identify the symptoms of someone having a stroke, whereas less than 1% can correctly identify all of the most common sepsis symptoms
- More Americans have never heard of sepsis (27%) than Ebola (5%), a nearly non-existent condition in the U.S.
- Nearly 58 million adults believe if you are healthy, an infection isn't anything you need to worry about (24%)

Hospitalization rates for sepsis or septicemia were similar for males and females and increased with age.

Figure 2. Rates of hospitalization for septicemia or sepsis, by sex and age, 2008



NOTES: Rates are significantly higher for males and females in each successive age group.
SOURCE: CDC/NCHS, National Hospital Discharge Survey, 2008.

http://www.cdc.gov/nchs/data/databriefs/db62.pdf

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Common Causes of Hospitalization Adults aged 85 and over: U.S.

First-listed diagnosis	2000	2005	2010	Percent change[1] (2000 to 2010)
	Rate of hospitalization per 1,000 population			
Congestive heart failure	48	47	43	−9.5
Pneumonia	51	52	34	−32.8
Urinary tract infection	19	24	30	+55.9
Septicemia	15	18	28	+84.8
Stroke	37	27	28	−25.0
Hip fracture	28	23	21	−25.4

[1]Percent change for each diagnosis is significant from 2000 through 2010 ($p < 0.05$).

NOTE: First-listed diagnosis is considered to be the main cause or reason for the hospitalization. The diagnoses were chosen because they were the top six first-listed diagnoses in 2010.

SOURCE: CDC/NCHS, National Hospital Discharge Survey, 2000–2010.

Levant S, Chari K, DeFrances CJ. Hospitalizations for patients aged 85 and over in the United States, 2000–2010. NCHS data brief, no 182. Hyattsville, MD: National Center for Health Statistics. 2015.

Sepsis Impact on Mortality in Hospitals

Table 1. Inpatients With Sepsis Diagnoses in the Kaiser Permanente Northern California Cohort and the Healthcare Cost and Utilization Project Nationwide Inpatient Sample[a]

	Inpatients With Sepsis Diagnoses[b]					
	Kaiser Permanente Northern California (2010-2012) (n = 21 Hospitals) (14 206 Deaths/482 828 Admissions)				Nationwide Inpatient Sample (2010) (n = 1051 Hospitals) (143 312 Deaths/6 555 621 Admissions)	
	Explicit	Explicit POA[c]	Implicit	Implicit POA[c]	Explicit	Implicit
Hospitalizations	55 008 (11.4) [11.3-11.5]	50 520 (10.5) [10.4-10.5]	80 678 (16.7) [16.6-16.8]	73 933 (15.3) [15.2-15.4]	280 663 (4.3) [4.3-4.3]	717 718 (10.9) [10.9-11.0]
Hospital mortality	6272 (11.4) [11.1-11.7]	5238 (10.4) [10.1-10.6]	7941 (9.8) [9.6-10.0]	7391 (10.0) [9.8-10.2]	49 664 (17.7) [17.6-17.8]	74 451 (10.4) [10.3-10.4]
% (95% CI) of all hospital deaths among patients with sepsis	44.2 (43.3-45.0)	36.9 (36.1-37.7)	55.9 (55.1-56.7)	52.0 (51.2-52.8)	34.7 (34.4-34.9)	52.0 (51.7-52.2)

1 out of 2-3 Deaths r/t Sepsis, Most POA

In KPNC 2012 subset, patient meeting criteria for EGDT comprised 32.6 percent of sepsis deaths & patients with sepsis, normal BP & lactate < 4 comprised 55.9% of sepsis deaths

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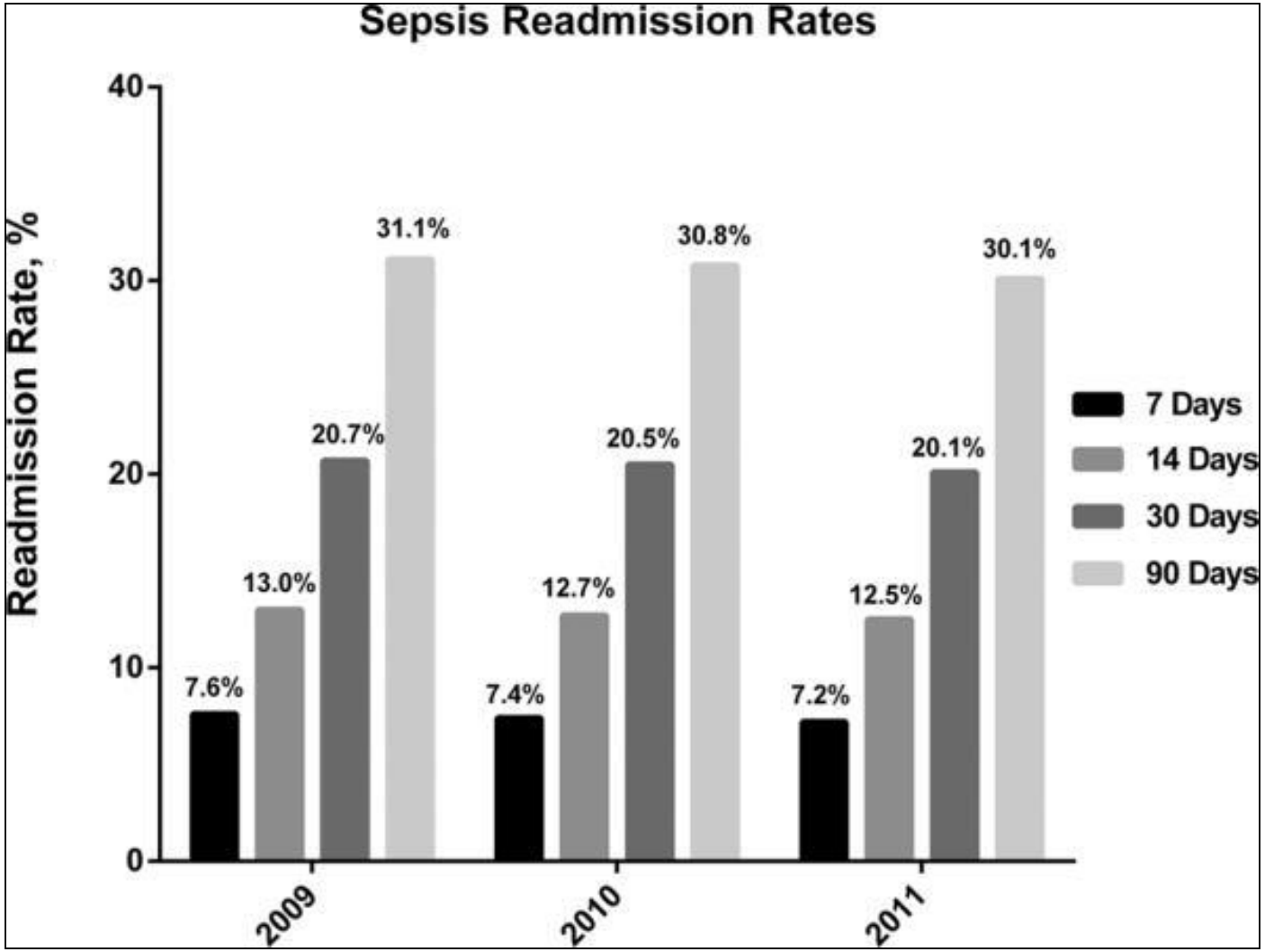
Liu V, et al. JAMA,2014:May 18th, online.



Chang DW; Tseng CH; Shapiro MF. Critical Care Medicine. 43(10):2085-93, 2015 Oct.

Proportion & Cost of Unplanned 30 day Readmissions after Sepsis (2013 Nationwide Readmission Database)

Table. Length of Stay and Cost for Unplanned 30-Day Readmissions After an Index Admission for Sepsis, Acute Myocardial Infarction, Heart Failure, Pneumonia, and Chronic Obstructive Pulmonary Disease

	National Readmission Data[a]			Weighted Proportion of Cases in the United States	
	No. of All Index Admissions Readmitted Within 30 Days	Estimated Mean Length of Stay (95% CI), d[b]	Estimated Mean Cost per Readmission (95% CI), $[b]	Percentage of Index Admissions Readmitted Within 30 Days (95% CI)	Percentage of Total Estimated Cost of All Readmissions (95% CI)
Admissions associated with 30 d readmission	1 187 697	6.4 (6.4-6.5)	8242 (8225-8258)	NA	100.0
Primary Analyses[c]					
Sepsis	147 084	7.4 (7.3-7.4)	10 070 (10 021-10 119)	12.2 (11.9-12.4)	14.5 (14.2-14.8)
Acute myocardial infarction	15 001	5.7 (5.6-5.8)	9424 (9279-9571)	1.2 (1.2-1.3)	1.4 (1.3-1.5)
Heart failure	79 480	6.4 (6.4-6.5)	9051 (8990-9113)	6.7 (6.5-6.8)	7.5 (7.3-7.7)
Pneumonia	59 378	6.7 (6.6-6.7)	9533 (9466-9600)	5.2 (5.0-5.3)	5.5 (5.4-5.7)
Chronic obstructive pulmonary disease	54 396	6.0 (5.9-6.0)	8417 (8355-8480)	4.6 (4.5-4.8)	4.3 (4.1-4.4)
Sensitivity Analyses[d]					
Sepsis	89 800	7.6 (7.6-7.7)	10 828 (10 760-10 897)	7.3 (7.1-7.5)	9.1 (8.8-9.4)
Acute myocardial infarction	21 281	6.0 (5.9-6.1)	9530 (9408-9654)	1.8 (1.7-1.8)	2.0 (1.9-2.1)
Heart failure	236 636	6.5 (6.5-6.5)	9248 (9211-9285)	20.0 (19.6-20.4)	22.1 (21.6-22.6)
Pneumonia	130 904	6.9 (6.9-7.0)	9749 (9700-9797)	11.1 (10.9-11.4)	12.5 (12.2-12.8)
Chronic obstructive pulmonary disease	201 867	6.3 (6.3-6.4)	8677 (8641-8713)	17.4 (17-17.7)	17.2 (16.7-17.7)

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Mayr FB, et al. JAMA, 2017, Jan 22nd published online

Discharge Disposition After Sepsis

	Septicemia or sepsis	Other diagnoses
Disposition	Percent	
Routine	39	79
Transfer to other short-term care facility	6	3
Transfer to long-term care institution	30	10
Died during the hospitalization	17	2
Other or not stated	8	6
Total	100	100

[1]Difference is statistically significant at the 0.05 level. SOURCE: CDC/NCHS, National Hospital Discharge Survey, 2008.

Michigan All Cause Readmission to any Hospital

Quality Improvement Organizations
Sharing Knowledge. Improving Health Care.
CENTERS FOR MEDICARE & MEDICAID SERVICES

Lake Superior Quality Innovation Network
MICHIGAN | MINNESOTA | WISCONSIN

All-Cause Readmission Within 30 Days of Index Discharge to Any, Same and Other Hospital by Top 10 Diagnosis Related Group (DRG), Michigan Medicare (FFS) Beneficiaries
[July 1, 2016 - June 30, 2017]

State of Michigan

			A	B	C	D	E	F	G	H
Rank	DRG	Title	% of Total DRG	No. of Discharges	No.30D Readmits to Any Hospital	% 30D Readmits to Any Hospital	No. 30D Readmits to Same Hospital	% 30D Readmits to Same Hospital	No. 30D Readmits to Other Hospital	% 30D Readmits to Other Hospital
1	871	SEPTICEMIA OR SEVERE SEPSIS W/O MV 96+ HOURS W MCC	5.14	17,474	3,765	21.55	2,850	16.31	915	5.24
2	885	PSYCHOSES	3.93	13,368	3,198	23.92	905	6.77	2,293	17.15
3	291	HEART FAILURE & SHOCK W MCC	3.16	10,756	3,003	27.92	2,261	21.02	742	6.90
4	392	ESOPHAGITIS, GASTROENT & MISC DIGEST DISORDERS W/O MCC	2.09	7,110	1,167	16.41	834	11.73	333	4.68
5	189	PULMONARY EDEMA & RESPIRATORY FAILURE	1.93	6,555	1,603	24.45	1,261	19.24	342	5.22

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What have hospital's done to decrease sepsis mortality?

Key Components of Sepsis Care

- Infection prevention
- Early identification
- Early and aggressive management (bundles)
- Avoid iatrogenic harm
  - Understand post sepsis syndrome and how to minimize its impact
  - Prevent sepsis readmissions

ALL of these must be provided across the continuum of care

Hospital Sepsis Program Components

- Infection Prevention
- Screening for early recognition—every patient every shift
- Nursing protocols to ensure early intervention for patients with severe sepsis
- Defined placement criteria
- Standardized ICU care
- Expand beyond the hospital walls
  - EMS
  - SNF
  - Home Care

Impact on the Elderly

- Age itself independent risk factor for death
- More likely admitted to ICU
- Highest mortality in the old elderly (85+)
- Prolonged hospitalization

Post Sepsis Impact

- Contributes to Cognitive decline
- Contributes to Physical long term disabilities (walking, ADLs, and IADLs)

Post-sepsis syndrome describes physical and/or long-term effects that affects up to 50% of people who survive sepsis.

Longer term effects of sepsis include:

- Sleep disturbance including insomnia
- Experiencing nightmares, hallucinations, flashbacks and panic attacks
- Muscle and joint pains which can be severe and disabling
- Extreme tiredness and fatigue
- Inability to concentrate
- Impaired mental (cognitive) functioning
- Loss of confidence and self-belief

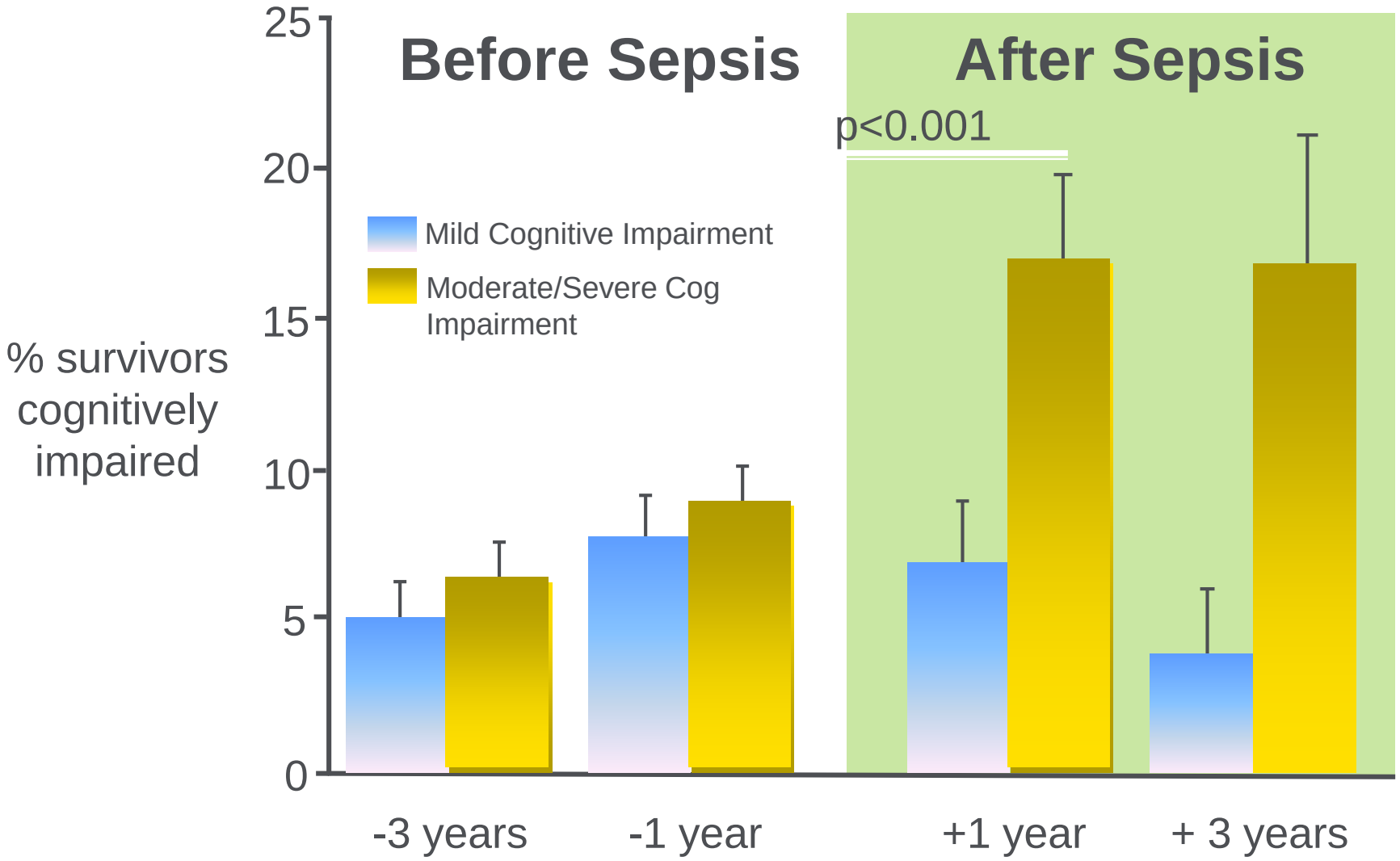
JAMA. Jan. 2, 2018 Patient Page, Postsepsis Morb

Post Sepsis Syndrome

- People who have suffered from severe sepsis and especially those treated in an intensive care unit are at greatest risk of suffering post-sepsis syndrome.
- *"60 percent of hospitalizations for severe sepsis were associated with worsened cognitive and physical function among surviving older adults. The odds of acquiring moderate to severe cognitive impairment were 3.3 times higher following an episode of sepsis than for other hospitalizations*."
- Sepsis survivors may be more at risk for developing other infections both viral and bacterial

Iwashyna, T. JAMA 2010;
Mukherjee, S SHOCK 2012

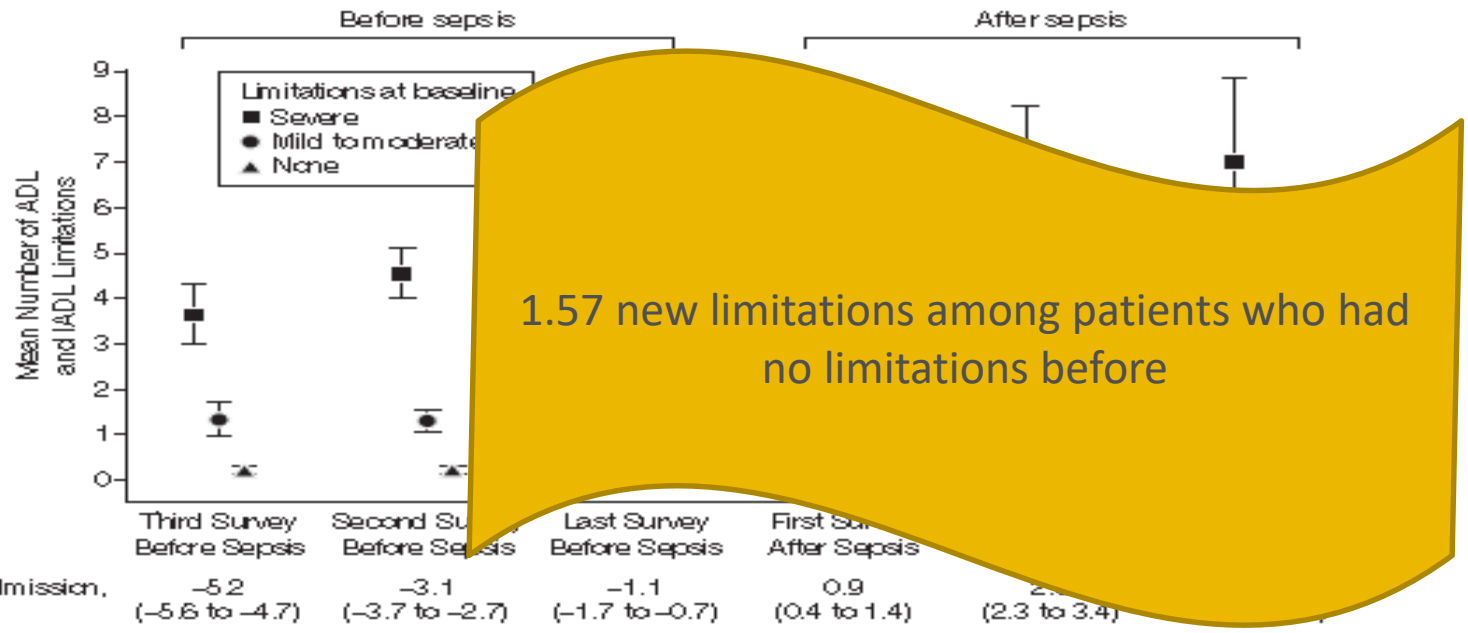
Cognitive Impairment: Sepsis



Iwashyna T, JAMA 2010;304:1787-1794

Functional Trajectories by Baseline Functioning

Figure 3. Functional Trajectories by Baseline Functioning



1.57 new limitations among patients who had no limitations before

Time to sepsis admission, median (IQR), y	−5.2 (−5.6 to −4.7)	−3.1 (−3.7 to −2.7)	−1.1 (−1.7 to −0.7)	0.9 (0.4 to 1.4)	(2.3 to 3.4)	
No. of patients, by baseline physical functioning						
Severe limits	87	127	159	159	42	14
Mild to moderate limits	105	151	195	195	93	28
No limits	142	206	269	269	153	56

ADL: walking, dressing, bathing, eating, getting into and out of bed and toileting

IADL: preparing a hot meal, shopping for groceries, making telephone calls, taking medicines, and managing money

Iwashyna T, JAMA 2010;304:1787-1794

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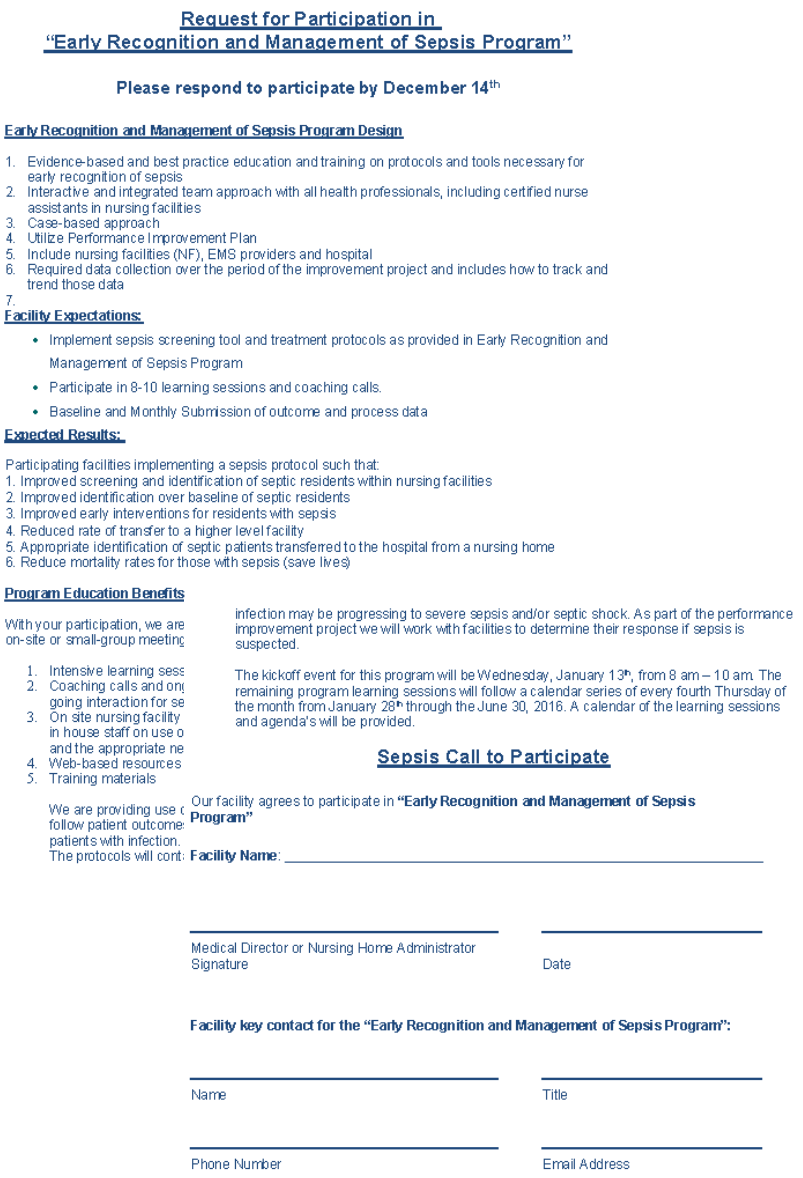
Cause of Post Sepsis Syndrome

- Response to systemic inflammation
- Brain, muscle and nerve injury from inflammation, ischemia and ischemia-reperfusion
- Poor perfusion, blood clots
- End organ damage

What can post hospital providers (SNFs)- do?

First steps we did:

- Developed collaborative relationship with all facilities through our local Extended Care Collaborative
- Identify top 10 facilities that we were sending patients to
- Identified sepsis as a priority disease to focus on
- Sent out call to participate—explaining program, getting commitment of facility leadership



Request for Participation in
"Early Recognition and Management of Sepsis Program"

Please respond to participate by December 14th

Early Recognition and Management of Sepsis Program Design

1. Evidence-based and best practice education and training on protocols and tools necessary for early recognition of sepsis
2. Interactive and integrated team approach with all health professionals, including certified nurse assistants in nursing facilities
3. Case-based approach
4. Utilize Performance Improvement Plan
5. Include nursing facilities (NF), EMS providers and hospital
6. Required data collection over the period of the improvement project and includes how to track and trend those data
7.

Facility Expectations:

- Implement sepsis screening tool and treatment protocols as provided in Early Recognition and Management of Sepsis Program
- Participate in 8-10 learning sessions and coaching calls.
- Baseline and Monthly Submission of outcome and process data

Expected Results:

Participating facilities implementing a sepsis protocol such that:
1. Improved screening and identification of septic residents within nursing facilities
2. Improved identification over baseline of septic residents
3. Improved early interventions for residents with sepsis
4. Reduced rate of transfer to a higher level facility
5. Appropriate identification of septic patients transferred to the hospital from a nursing home
6. Reduce mortality rates for those with sepsis (save lives)

Program Education Benefits

With your participation, we are
on-site or small-group meeting

1. Intensive learning sess
2. Coaching calls and ong
going interaction for se
3. On site nursing facility
in house staff on use o
and the appropriate ne
4. Web-based resources
5. Training materials

We are providing use
follow patient outcome
patients with infection.
The protocols will cont

infection may be progressing to severe sepsis and/or septic shock. As part of the performance improvement project we will work with facilities to determine their response if sepsis is suspected.

The kickoff event for this program will be Wednesday, January 13th, from 8 am – 10 am. The remaining program learning sessions will follow a calendar series of every fourth Thursday of the month from January 28th through the June 30, 2016. A calendar of the learning sessions and agenda's will be provided.

Sepsis Call to Participate

Our facility agrees to participate in **"Early Recognition and Management of Sepsis Program"**

Facility Name: _____

_____ _____
Medical Director or Nursing Home Administrator Signature — Date

Facility key contact for the "Early Recognition and Management of Sepsis Program":

_____ _____
Name — Title

_____ _____
Phone Number — Email Address

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Early Recognition and Management of Sepsis

Overview of Training Program

- Bi-Monthly one hour face to face meetings
  - Will follow the local ECC meeting
  - Walk through action plan to implement a sepsis early identification and management program that includes a focus on infection prevention
- (optional) Bi-Monthly site specific coaching calls, to provide individualized support
- Provide training and educational materials (powerpoints, recorded videos ect)
- Defined process and outcome measures to evaluate success of the program

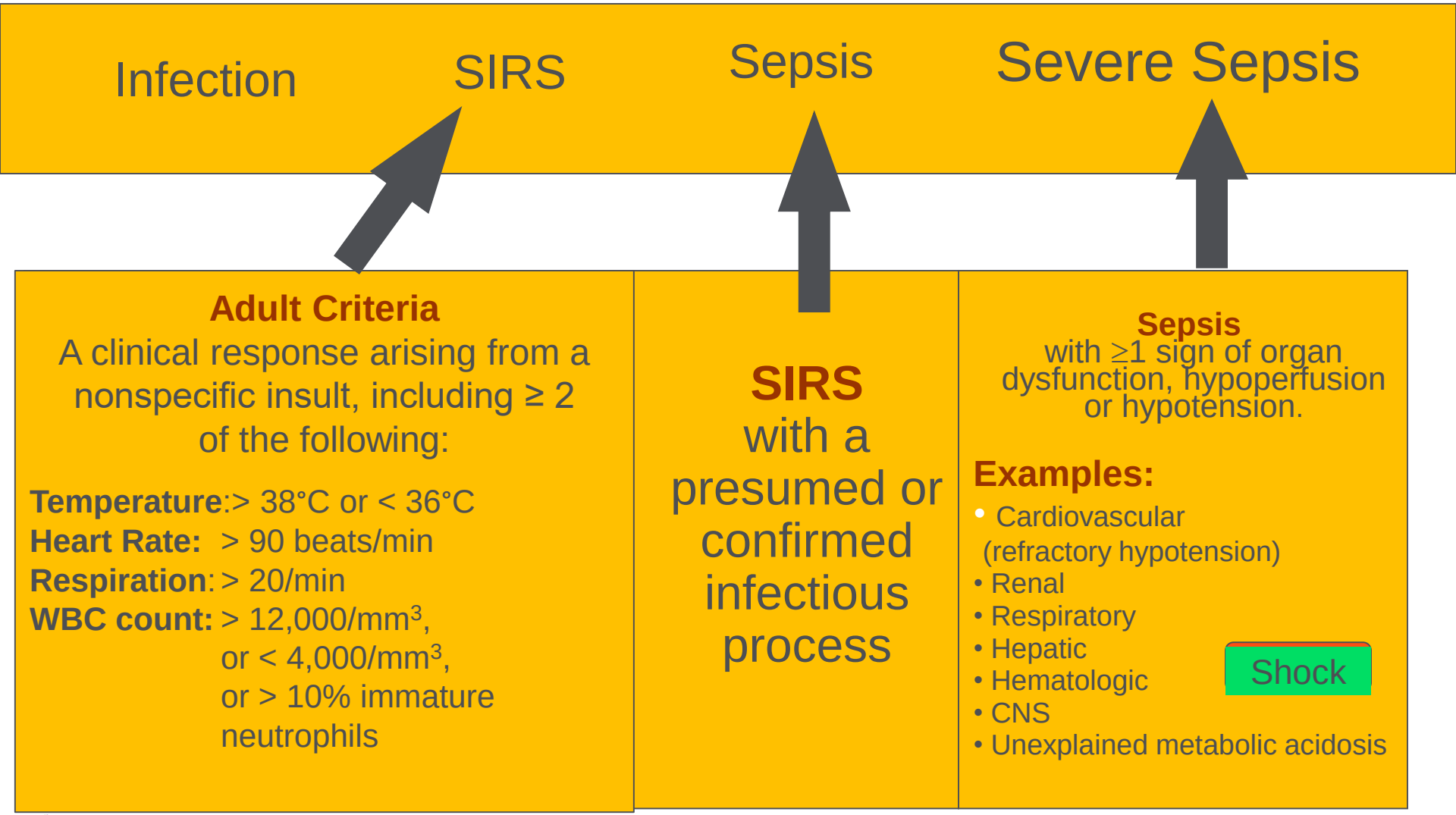
Roles and Responsibilities

- Each facility must have a team identified to do this work
  - Should include: medical director, DON (or designee), infection prevention nurse at a minimum
- Team work through action plan provided in specified timeframe
- Implement screening process
- Implement early management of sepsis process
- Educate staff on screening and management processes
- Assess current infection prevention practices related to PNA, UTI and CLABSI and identify one intervention to improve upon
- Collect defined process and outcome data

First Focus

- Educate on why sepsis and why now.
- Educate on what is sepsis, definitions and evidence based management
- Review early identification process: routine screening

Severe Sepsis: Defining a Disease Continuum



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SIRS = Systemic Inflammatory Response Syndrome

Bone et al. *Chest.*1992;101:1644-1654.

Identifying Acute Organ Dysfunction as a Marker of Severe Sepsis

Neurological

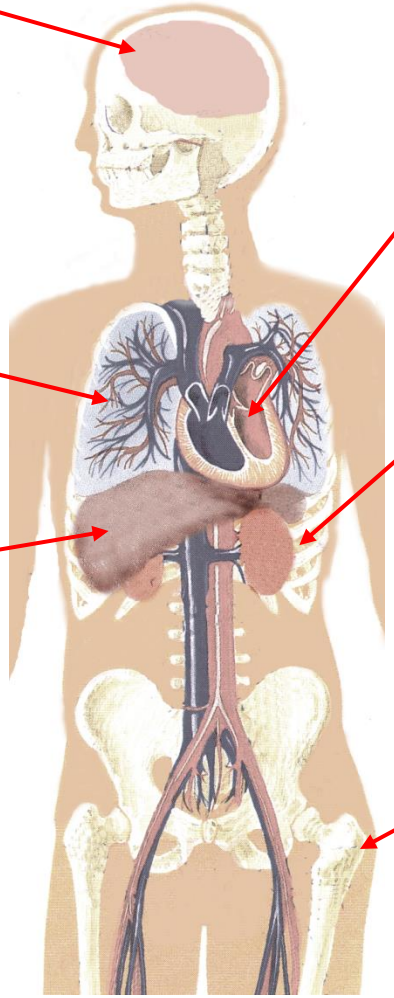
Altered level of consciousness (unrelated to primary neuro pathology)

Respiratory

Increased O2 requirements
SaO2 < 90%

Metabolic

Unexplained metabolic acidosis
•pH≤7.30 or Base deficit ≥ 5.0 mEq/l
•Lactate > 4



Cardiovascular

Tachycardia
SBP<90mmHg

Renal

UO <0.5 ml/kg per hr (despite fluid)

creatinine increase of greater than 0.5mg/dl from baseline

Hematologic

Platelets <80,000/mm3
Decline in platelet count of 50% over 3 days

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Except on few occasions, the patient appears to die from the body's response to infection rather than from it."

Sir William Osler – 1904
The Evolution of Modern Medicine

Homeostasis Is Unbalanced in Severe Sepsis

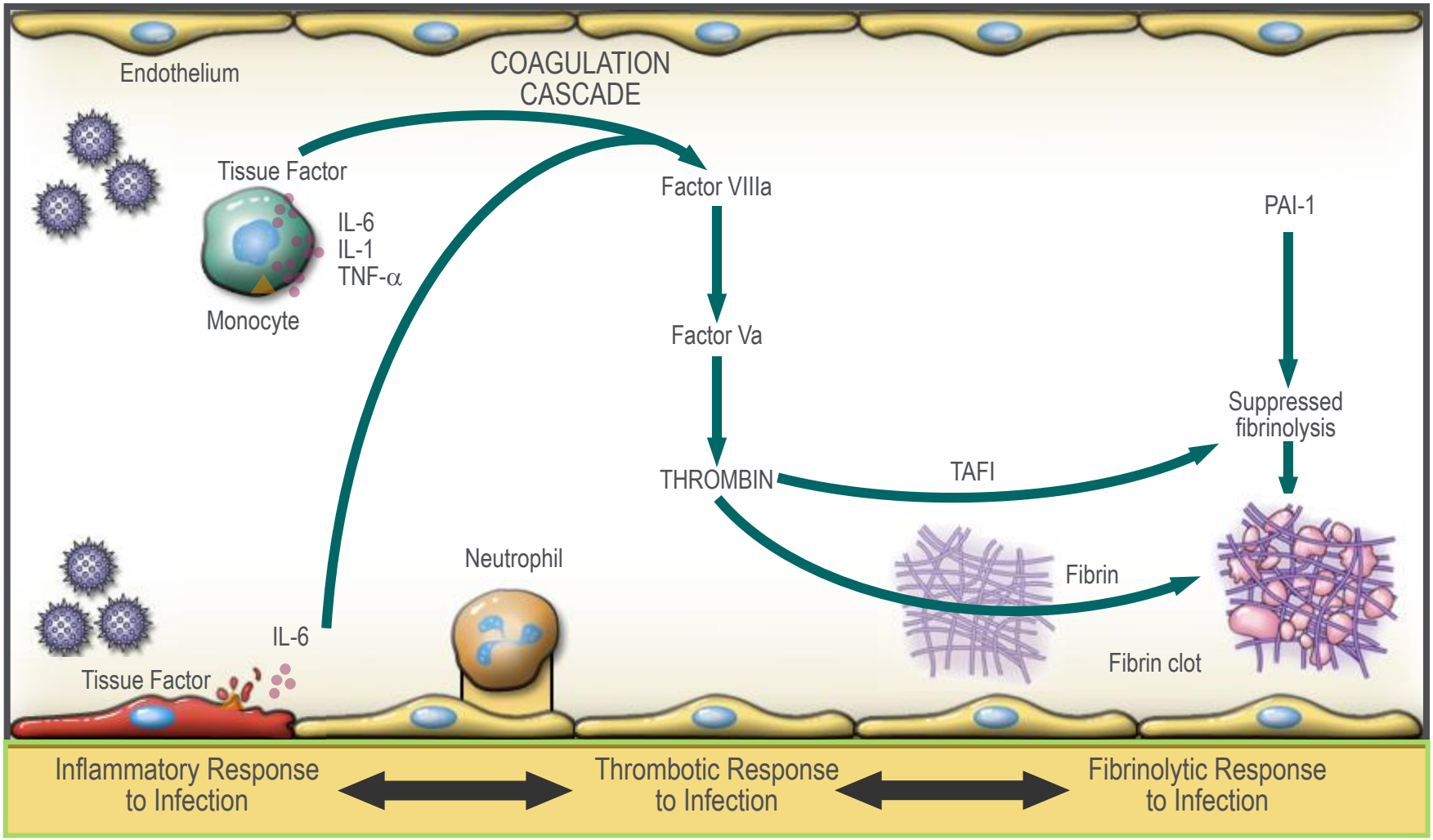
⇧ **Coagulation**

⇧ **Inflammation**

⇩ **Fibrinolysis**

Carvalho AC, Freeman NJ. *J Crit Illness.* 1994;9:51-75; Kidokoro A et al. *Shock.* 1996;5:223-8; Vervloet MG et al. *Semin Thromb Hemost.* 1998;24:33-44.

Inflammation, Coagulation and Impaired Fibrinolysis In Severe Sepsis



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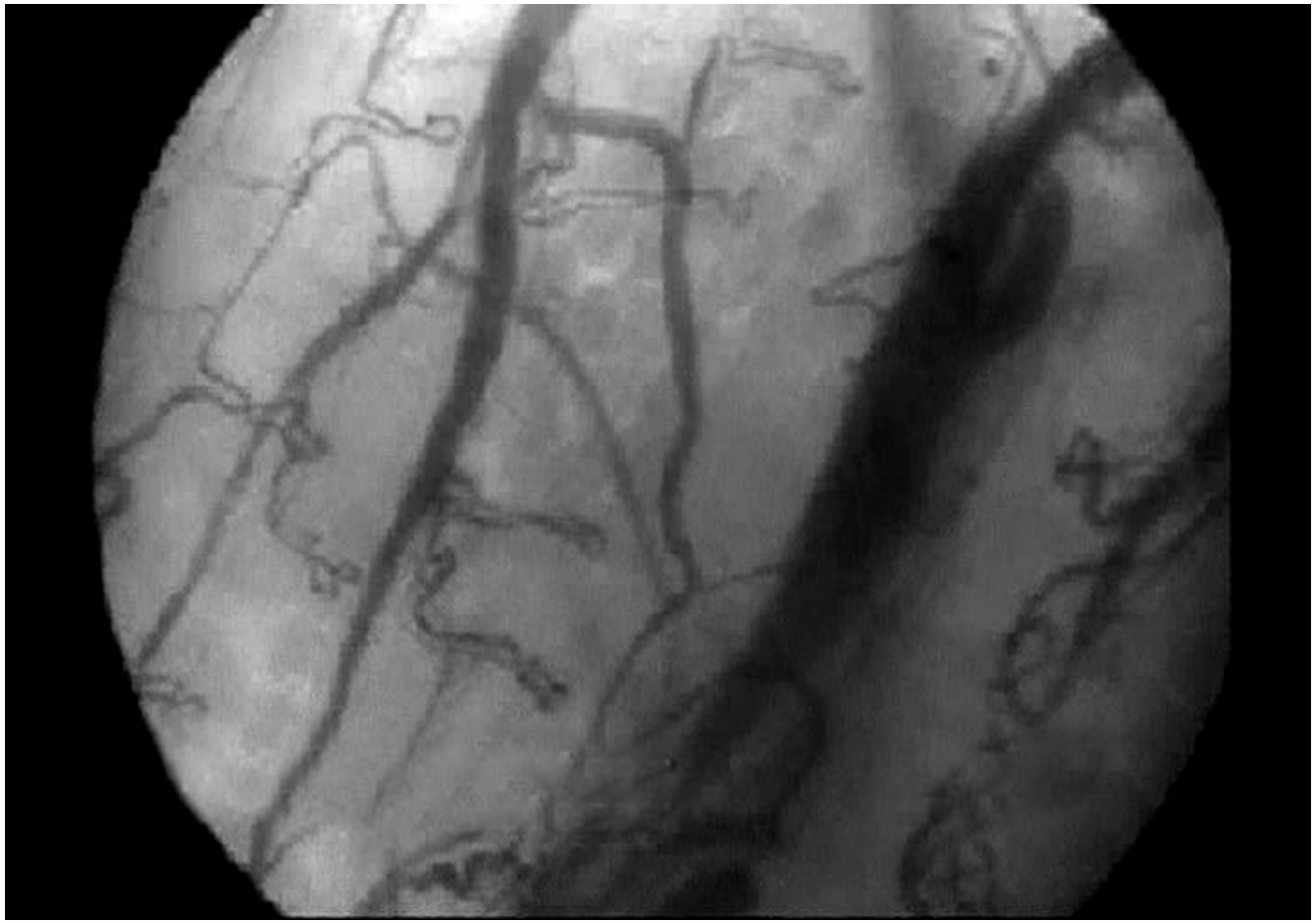
Microcirculation of Septic Patient: Orthogonal Polarization Spectral Imaging

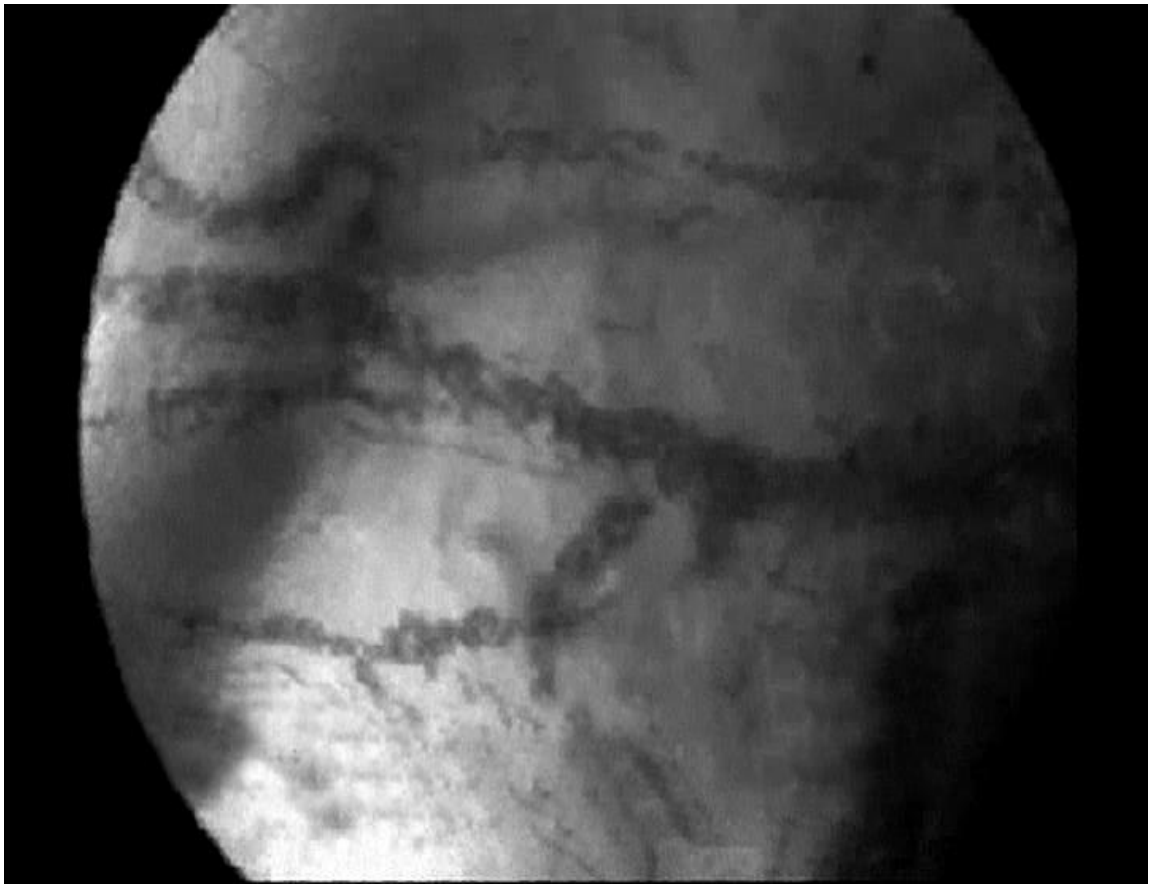
- BP: 120/80 Hg
- SaO_2: 98%



1. www.opsimaging.net. Accessed April 2004.
2. Spronk PE, Ince C, Gardien MJ, et al. Nitroglycerin in septic shock after intravascular volume resuscitation. *Lancet.* 2002; 360:1395-1396.

Microcirculation of Septic Shock Patient: Orthogonal Polarization Spectral Imaging

- Resuscitated with fluids and dopamine
  - HR: 82 BPM
  - BP: 90/35 mm Hg
  - SaO_2: 98%
  - CVP: 25 mm Hg



1. www.opsimaging.net. Accessed April 2004.
2. Spronk PE, Ince C, Gardien MJ, et al. Nitroglycerin in septic shock after intravascular volume resuscitation. *Lancet.* 2002; 360:1395-1396.

Definitions

- Infection
- Sepsis: infection plus 2 or more SIRS
- Severe Sepsis: infection plus 2 or more SIRS plus new organ dysfunction
- Septic Shock: severe sepsis with a lactic acid greater than or equal to 4mmol/L OR continued hypotension (systolic BP<90 or 40mmHg decrease from their baseline) after initial fluid bolus (30ml/kg)

SEPSIS (SEVERE SEPSIS) AND SEPTIC SHOCK ARE MEDICAL EMERGENCIES, AND WE RECOMMEND THAT TREATMENT AND RESUSCITATION BEGIN IMMEDIATELY

2017 Surviving Sepsis Guidelines Best Practice Statement

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TO SAVE LIVES.....

Early identification

Early antibiotics

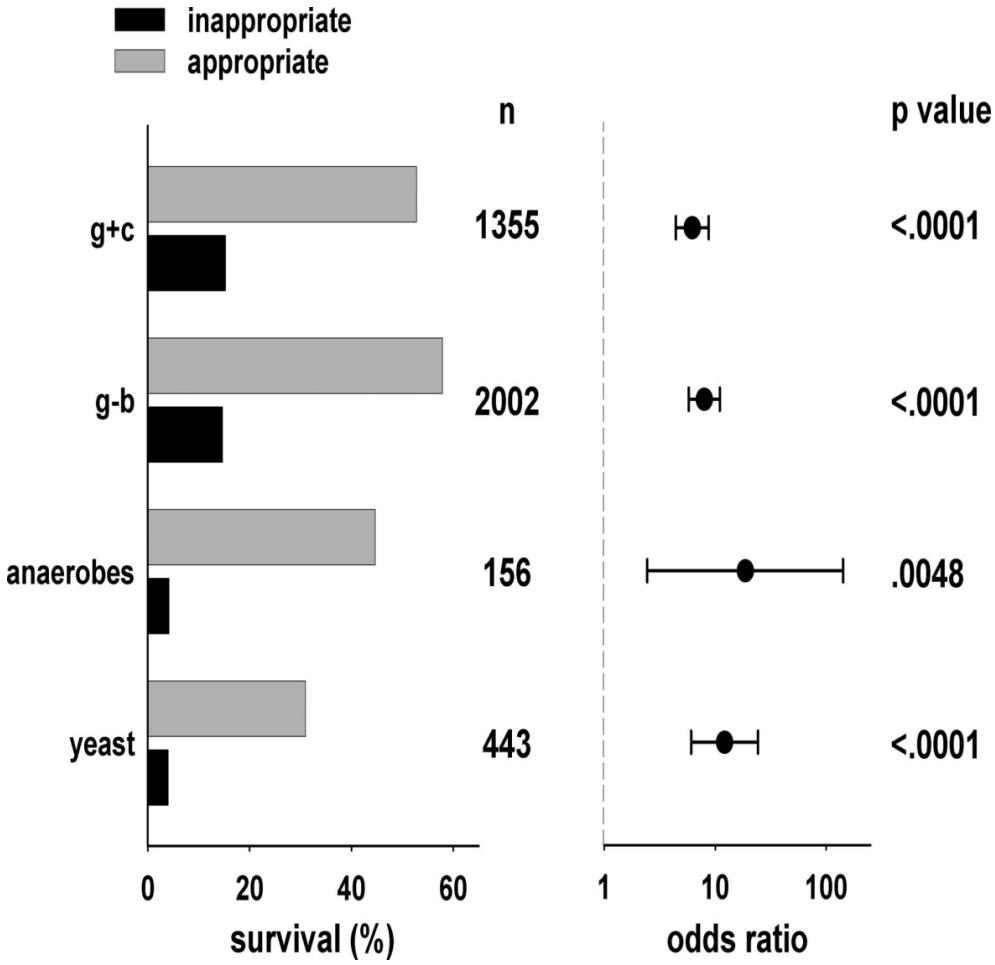
Early fluid resuscitation

Initiation of Inappropriate Antimicrobial Therapy Results in a 5-fold Reduction of Survival in Human Septic Shock

- Objective: Determine the impact of the initiation of inappropriate antimicrobial therapy on survival to hospital discharge of patients with septic shock
- Retrospective review of 5,715 patients from 22 different hospitals in Canada, US and Saudi Arabia
- Data collected from 1996-2005

Initiation of Inappropriate Antimicrobial Therapy Results in a 5-fold Reduction of Survival in Human Septic Shock

- 5,715 patients in septic shock in three countries
- 55% of cases were from community acquired infection
- Decrease in survival with inappropriate initial antibiotics was fivefold



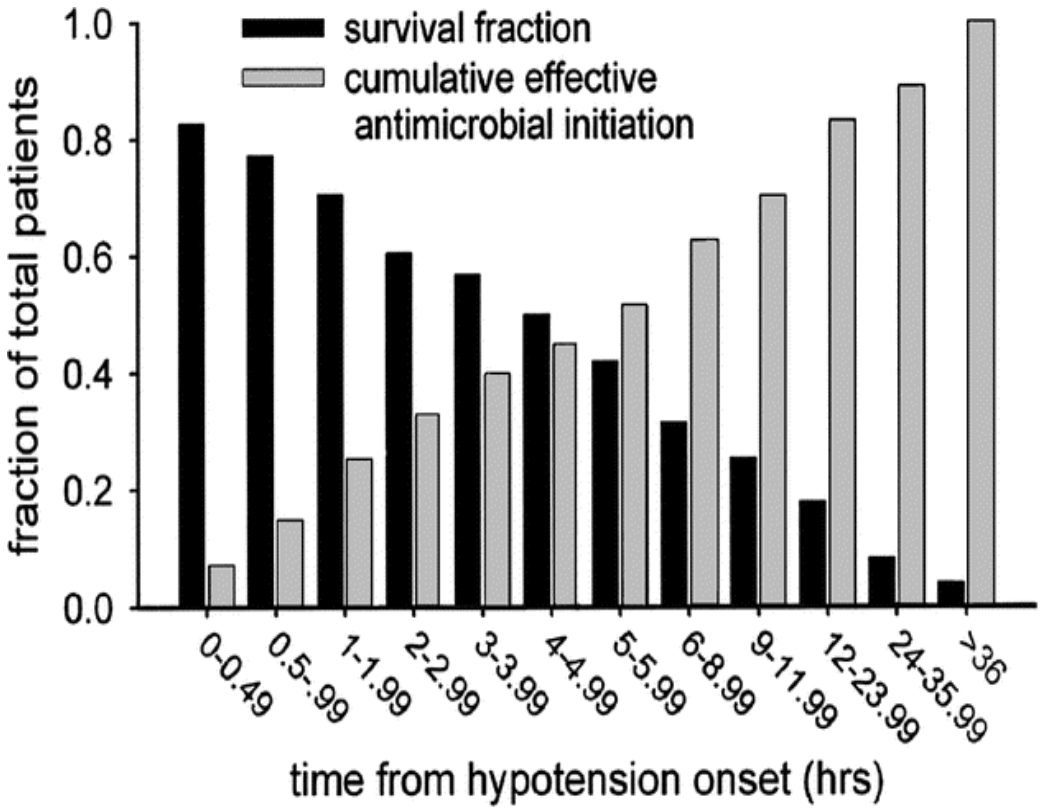
Kumar A. et al. Chest, 2009; 136; 1237-1248

Duration of Hypotension Before Initiation of Effective Antimicrobial Therapy is the Critical Determinant of Survival in Human Septic Shock

*2,154 septic shock patients

*Effective antimicrobial administration within the 1st hour of documented hypotension was associated with increased survival in patients with septic shock

*Each hour of delay over the next 6 hours was associated with an average decrease in survival of 7.6% (range 3.6-9.9%)



CCM 2006 Vol. 34 No.6

SEP-1

TO BE COMPLETED WITHIN 3 HOURS OF TIME OF PRESENTATION † :

1. Measure lactate level
2. Obtain blood cultures prior to administration of antibiotics
3. Administer broad spectrum antibiotics
4. Administer 30ml/kg crystalloid for hypotension or lactate ≥4mmol/L

† *"time of presentation" is defined as the time of earliest chart annotation consistent with all elements severe sepsis or septic shock ascertained through chart review.*

SEP-1

TO BE COMPLETED WITHIN 6 HOURS OF TIME OF PRESENTATION:

5. Apply vasopressors (for hypotension that does not respond to initial fluid resuscitation) to maintain a mean arterial pressure (MAP) ≥65mmHg
6. In the event of persistent hypotension after initial fluid administration (MAP < 65 mm Hg) or if initial lactate was ≥4 mmol/L, re-assess volume status and tissue perfusion and document findings according to table 1.
7. Re-measure lactate if initial lactate elevated.

SEP-1

TABLE 1

DOCUMENT REASSESSMENT OF VOLUME STATUS AND TISSUE PERFUSION WITH:

Either

- Repeat focused exam(after initial fluid resuscitation) by licensed independent practitioner including vital signs, cardiopulmonary, capillary refill, pulse and skin findings.

Or two of the following:

- Measure CVP
- Measure ScvO2
- Bedside cardiovascular ultrasound
- Dynamic assessment of fluid responsiveness with passive leg raise or fluid challenge

Early Identification through Screening

Severe Sepsis Screening Tool

Directions: The screening tool is for use in identifying residents upon admission, daily on every shift and PRN upon condition change or a STOP AND WATCH notification.

Date / Time							
I. Systemic Inflammatory Response Syndrome (SIRS)							
Temperature greater than or equal to 101 or less than or equal to 96.8							
Heart rate greater than 90 beats/minute							
Respiratory rate greater than 20 breaths/minute							
WBC greater than 12,000 or less than 4,000 (do not use blood work greater than 24 hours old),							
Blood glucose greater than 140 in non-diabetics (Obtain if 1 or more SIR present)							
Check blood glucose if any one above is checked. **If less than two checked above - negative screen for sepsis (initial)_____Continue to assess resident. Proceed to II** if one or more checked.							
If two checked above, proceed to II.							
II. Infection							
Suspected or documented infection							
Antibiotic therapy							
If no checks above - negative screen for sepsis (initial) _____ No need to proceed to III. Continue to assess resident for changes: STOP and WATCH early warning tool or using your senses. **If one checked above, patient has screened positive for sepsis.** Place resident on I & O. Monitor and record urine output every shift. Obtain order to lactic acid and **proceed to III.**							
III. Organ Dysfunction							
Respiratory: SAO2 less than 90% or increasing O2 requirements							
Cardiovascular: SBP less than 90 mmHg or 40 mmHg less than baseline							
Renal: Urine output less than 0.5 ml/kg over last 8 hours							
CNS: Mental status changes							
Labs: Do not use lab results older than 24 hours							
Platelets less than 100,000							
INR greater than 1.5							
Bilirubin greater than or equal to 2 mg/dl							
Serum lactic acid greater than 2 mEq/l							
If no checks above - negative screen for severe sepsis (initial) __ Continue to access. No further action at this time. **If one checked above - patient screens positive for severe sepsis.** Review advance directives. Contact family if no advance directives on record. Call physician and follow SBAR.							

SITUATION	Tell physician resident screened positive for severe sepsis.
BACKGROUND	Describe positive SIRS; inform physician if resident is currently being treated for a known infection; share which organ system has dysfunction.
ASSESSMENT	Share VS, the SAO2 (pulse ox) and any additional vital information.
RECOMMENDATION Request order for following	Blood cultures; CBC; lactic acid (if not previously drawn); IV antibiotic. The systolic blood pressure is less than 90 mmHg (or 40 mmHg less than baseline) - need an order to administer fluid bolus of 30 ml/kg over 1 hour. After reassessment; if resident's hypotension has not resolved, may we send to the ER?

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Livonia, MI

Screening

- **When do you screen**?
  - Upon admission, daily, with condition change or stop and watch alert or if receiving antibiotics
- **First step**: Does the patient have signs of systemic inflammatory response syndrome (SIRS)?

Date / Time							
I. Systemic Inflammatory Response Syndrome (SIRS)							
Temperature greater than or equal to 101 or less than or equal to 96.8							
Heart rate greater than 90 beats/minute							
Respiratory rate greater than 20 breaths/minute							
WBC greater than 12,000 or less than 4,000 (do not use blood work greater than 24 hours old),							
Blood glucose greater than 140 in non-diabetics (Obtain if 1 or more SIR present)							
Check blood glucose if any one above is checked. If less than two checked above - negative screen for sepsis (initial)_____Continue to assess resident. Proceed to II if one or more checked.							
If two checked above, proceed to II.							

Screening

- **Second Step**: Does the patient have a known or suspected infection?

II. Infection							
Suspected or documented infection							
Antibiotic therapy							
If no checks above - negative screen for sepsis (initial) _____ No need to proceed to III. Continue to assess resident for changes: STOP and WATCH early warning tool or using your senses. **If one checked above, patient has screened positive for sepsis.** Place resident on I & O. Monitor and record urine output every shift. Obtain order to lactic acid and **proceed to III.**							

Screening

- **Third Step**: Does the patient have any new organ dysfunction in an organ system distant from site of infection?

III. Organ Dysfunction							
Respiratory: SAO2 less than 90% or increasing O2 requirements							
Cardiovascular: SBP less than 90 mmHg or 40 mmHg less than baseline							
Renal: Urine output less than .5 ml/kg over last 8 hours							
CNS: Mental status changes							
Labs: Do not use lab results older than 24 hours							
Platelets less than 100,000							
INR greater than 1.5							
Bilirubin greater than or equal to 2 mg/dl							
Serum lactic acid greater than 2 mEq/l							
If no checks above - negative screen for severe sepsis (initial) __ Continue to access. No further action at this time. **If one checked above - patient screens positive for severe sepsis.** Review advance directives. Contact family if no advance directives on record. Call physician and follow SBAR.							

Screening

- If screens positive for severe sepsis, then follow the SBAR at bottom of tool

SITUATION	Tell physician resident screened positive for severe sepsis
BACKGROUND	Describe positive SIRS; inform physician if resident is currently being treated for a known infection; share which organ system has dysfunction
ASSESSMENT	Share VS, the SAO2 (pulse ox) and any additional vital information
RECOMMENDATION **Request order for following**	Blood cultures; CBC; lactic acid (if not previously drawn); IV antibiotic The systolic blood pressure is less than 90 mmHg (or 40 mmHg less than baseline) - need an order to administer fluid bolus of 30 ml/kg over 1 hour. After reassessment; if resident's hypotension has not resolved, may we send to the ER?

Point Click Care

Background / History	The screening tool is for use in identifying guests upon admission, daily on every shift, AND prn upon conidtion change or a Stop And Watch notification H **1.** Is the guest's / elder's history suggestive of a new infection? H ☐ 1. Pnuemonia, Empyema ☐ 2. Urinary tract infection ☐ 3. Acute abdominal Infection ☐ 4. Meningitis ☐ 5. Skin/Soft Tissue Infection ☐ 6. Bone/Joint infection ☐ 7. Wound Infection ☐ 8. Blood stream catheter infection ☐ 9. Endocarditis ☐ 10. Implantable device infection ☐ 11. Other infection
Systemic Inflammatory Response Syndrome (SIRS)	**2.** Are any two of the following signs and symptoms of infection both present and new to the guest/elder? H ☐ 1. Hyperthermia (>101.0 °F) ☐ 2. Hypothermia (<96.8°F) ☐ 3. Altered mental status ☐ 4. Tachycardia > 90 bpm ☐ 5. Tachypnea > 20 bpm ☐ 6. Leukocytosis (WBC count >12,000 µL–1) ☐ 7. Leukopenia (WBC count < 4000 µL–1) ☐ 8. Hyperglycemia (plasma glucose >140 mg/dL) or 7.7 mmol/L in the absence of diabetes If less than 2 checked above - negative screen for Sepsis. Continue to assess guest. {Proceed to no.2 if one or more checked}. H
Infection	**3.** ☐ Suspected or documented infection H **iv.** ☐ Antibiotic Therapy H If no checks above - negative screen for sepsis No need to proceed to 3. Continue to assess guest/elder for changes: STOP and WATCH early warning tool or using your senses.If one checked above, guest/elder has screened positive for sepsis. Place resident on I & O. Monitor and record urine output every shift. Obtain order to lactic acid and proceed to 3. H
Organ Dysfunction	**4.** Are any of the following organ dysfunction criteria present at a site remote from the site of the infection that are NOT considered to be chronic conditions? H ☐ 1. SBP < 90 mmHg ☐ 2. SBP decrease > 40 mm Hg from baseline ☐ 3. Creatinine > 2.0 mg/dl (176.8 mmol/L) ☐ 4. Bilirubin > 2 mg/dl (34.2 mmol/L) ☐ 5. Platelet count < 100,000 µL ☐ 6. Lactate > 2 mmol/L (18.0 mg/dl) ☐ 7. Coagulopathy (INR >1.5 or aPTT >60 secs) ☐ 8. Acute lung injury with SA02 <90% or increasing O2 requirements ☐ 9. Acute lung injury with SAO2 < 90% or increasing O2 requirements in the presence of pneumonia as infection source ☐ 10. Change in LOC- Mental status changes Labs: Do not use lab results older than 24 hours H **5.** If no checks above- negative screen for severe sepsis {Continue to assess. No further action at this time}. H **vi.** If one is checked above- guest/ elder screens positive for severe sepsis. {Review advance directives. Contact family if no advance directives on record. Call physician and follow SBAR.} H SITUATION **6.** Tell physician guest /elder screened positive for severe sepsis H ☐ 1. Done ☐ 2. N/A = Not Applicable BACKGROUND **7.** Describe positive SIRS; inform physician if resident is currently being treated for a known infection; share which organ system has dysfunction. H ☐ 1. Done ☐ 2. N/A = Not Applicable ASSESSMENT **8.** Share VS, the SAO2 (pulse ox) and any additional vital information. H ☐ 1. Done ☐ 2. N/A = Not Applicable RECOMMENDATION **9.** Blood cultures; CBC; lactic acid (if not previously drawn); IV antibiotic. The systolic blood pressure is less than 90 mmHg (or 40 mmHg less than baseline) - need an order to administer fluid bolus of 30 ml/kg over 1 hour. After reassessment; if resident's hypotension has not resolved, may we send to the ER? H ☐ 1. Done ☐ 2. N/A = Not Applicable

ECTION Cust. Evaluation for Severe Sepsis Screening Tool (1)

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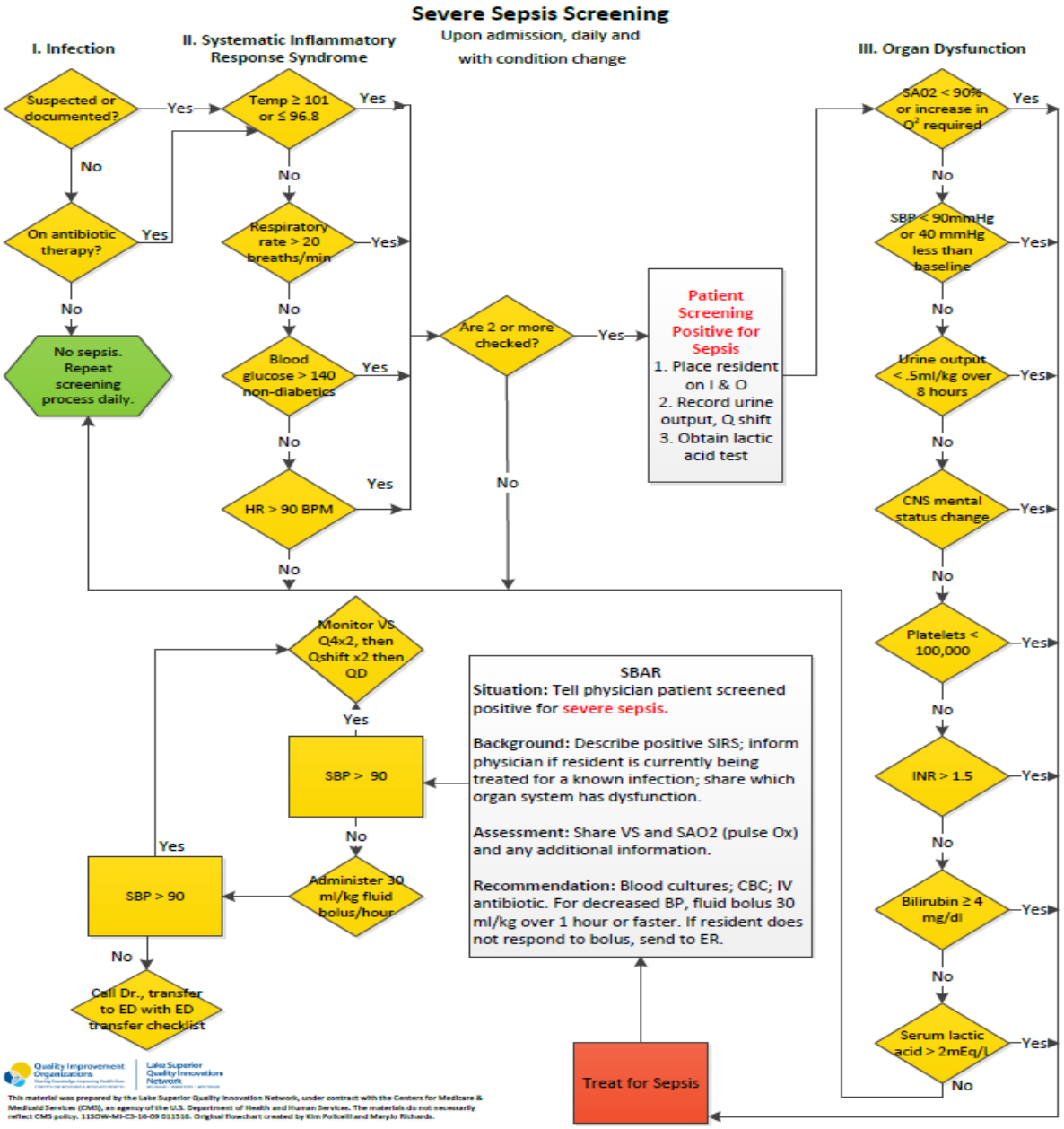

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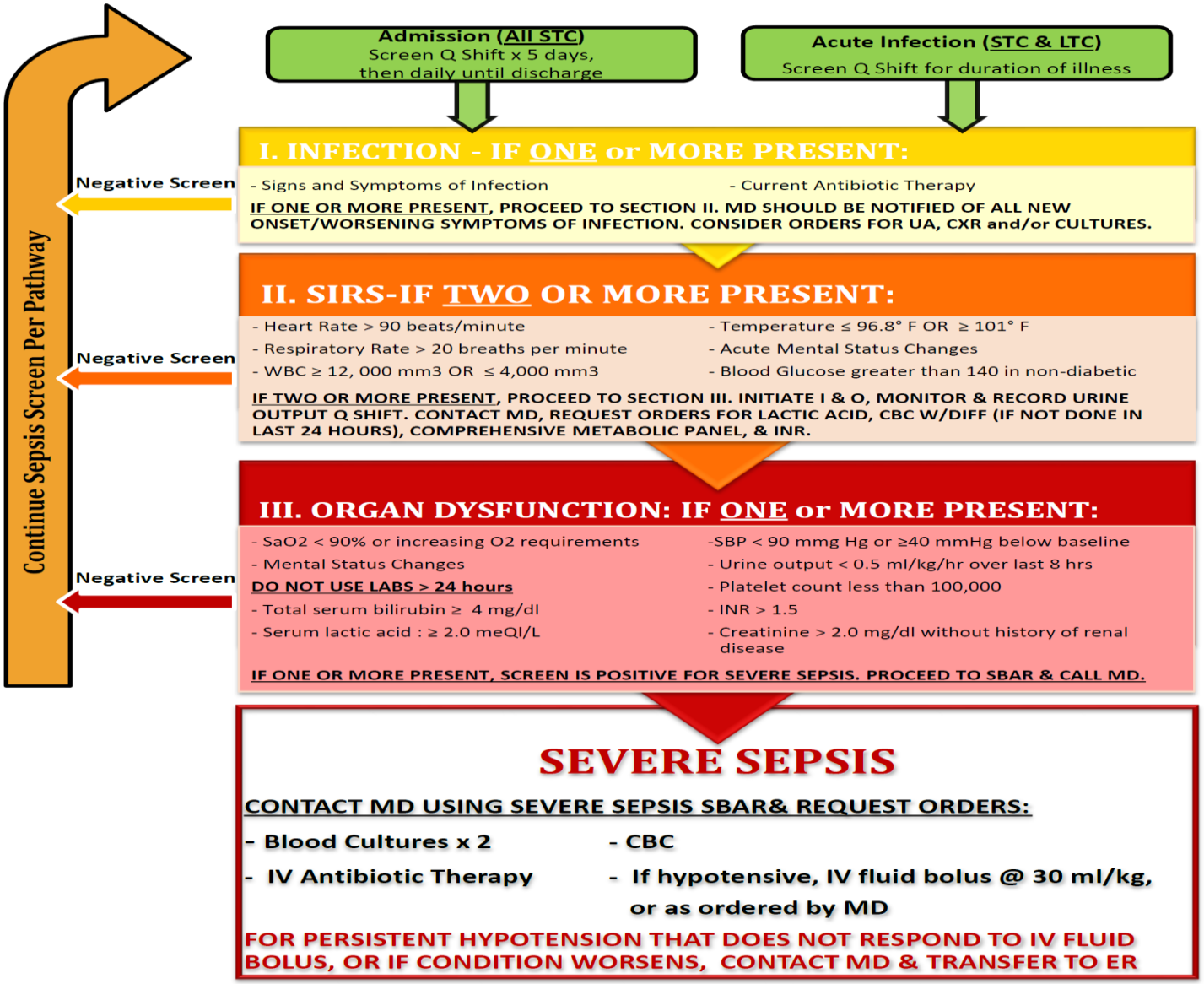
EVANGELICAL HOMES OF MICHIGAN
Exceptional Services, Innovative Solutions

Evangelical Home-Saline Sepsis Screening Pathway



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ECF-Severe Sepsis Bundle

For patients with a known/suspected infection + 2 or more SIRS + new organ dysfunction
(provide the following interventions per physician order)

- Blood cultures x 2 (prior to antibiotics)
- Obtain lactic acid, if greater than 2 get repeat in 6 hours
- Broad spectrum IV antibiotic(s) within 1 hour of screening positive for severe sepsis.
- Vital signs: twice a shift x 24 hrs (if a PRISM 1 or 2: every 4 hours x 2, then every shift x 2, then qd)
- Monitor I & O every shift
- If SBP <90 mmHg or 40mmHg decrease from their baseline, administer a 30ml/kg fluid bolus as fast as possible

  IF resident's hypotension has not resolved,
  call physician regarding transfer to the ED

Perform severe sepsis screen every shift and with a condition change or a STOP and WATCH notification

Stop and Watch (INTERACT®)

- **Link with current process**
- **Educate CNAs**

S – Seems different than usual

T – Talks or communicates less 

O – Overall needs more help

P – Pain, new or worsening – Participating less in activities

A – Ate less 

N – No bowel movement in 3 days/diarrhea

D – Drank less 

W – Weight change 

A – Agitated or nervous more than usual

T – Tired, weak, confused, or drowsy 

C – Change in skin color or condition

H – Help with walking, transferring, toileting more than usual

Sepsis Early Identification Action Plan

Step	Who? When?	Status
1. Get team together to create early identification process		
2. Develop screening tool/process		
3.Get medical staff support for screening and early intervention		
4. Develop and implement educational plan for sepsis and screening		
5. Develop patient & family education process and tools		
6. Evaluate screening: define outcome and process metrics		
7. Develop an infection prevention education plan for PNA, UTI, and CLABSI		

Typical Agenda

- Review homework from prior meeting
  - Round Robin
    - Identify issues and barriers
    - Group networking and problem solving
- Review discuss next area on action plan
- Define homework

Early Recognition and Management of Sepsis Program

Program Agenda

Thursday, January 28, 2016 | 9 am-10 am | SJMHS Women's Health Center, Room 1A

Agenda item	Description	Length of Time
Welcome and Roll Call		2 minute
Round Robin	Open Discussion for Action Plan Steps 1-3 and results of sepsis screening on 10 patients	45 minutes
Sepsis Bundle	Discussion of implementation of a sepsis bundle	5 minutes
Action Plan	Review of the next activity, coaching calls or learning session	2 minutes
Homework	Define content for your staff education, whom will provide education, and implementation plan for the program	3 minutes
Coaching calls	Sign-up for coaching calls	3 minutes

Provide homework for teams at each meeting

Homework after first meeting:

- Complete 1-3 on action plan
- Screen 10 patients using the screening tool

Education for staff

- Tools and materials:
  - Powerpoint presentation from today (slides 8-49)
  - Videos from MPRO : https://www.youtube.com/playlist?list=PL5ITOxWOe7JoWfbVblphE1rOOh1uCavBA

Your homework related to education (item 4 on action plan):

- Define content for your staff education and whom will provide education
- Develop implementation plan for the program

Infection Prevention

- After sepsis focus on infection prevention:
  - PNA
  - UTI
  - CLABSI

Early Recognition and Management of Sepsis
PNA Prevention
Action Plan

Step	Who? When?	Status
1. Agree on evidence based practice to implement		
2. Understand current practice (walk the process, talk to staff)		
3. Where is gap between current practice and evidence based practice?		
4. Identify barriers to implementing new practice and strategies to resolve them		
5. Educate staff on new/revised practice		
6. Implement new practice		
7. Audit new process		

Post-Acute Sepsis Toolkit

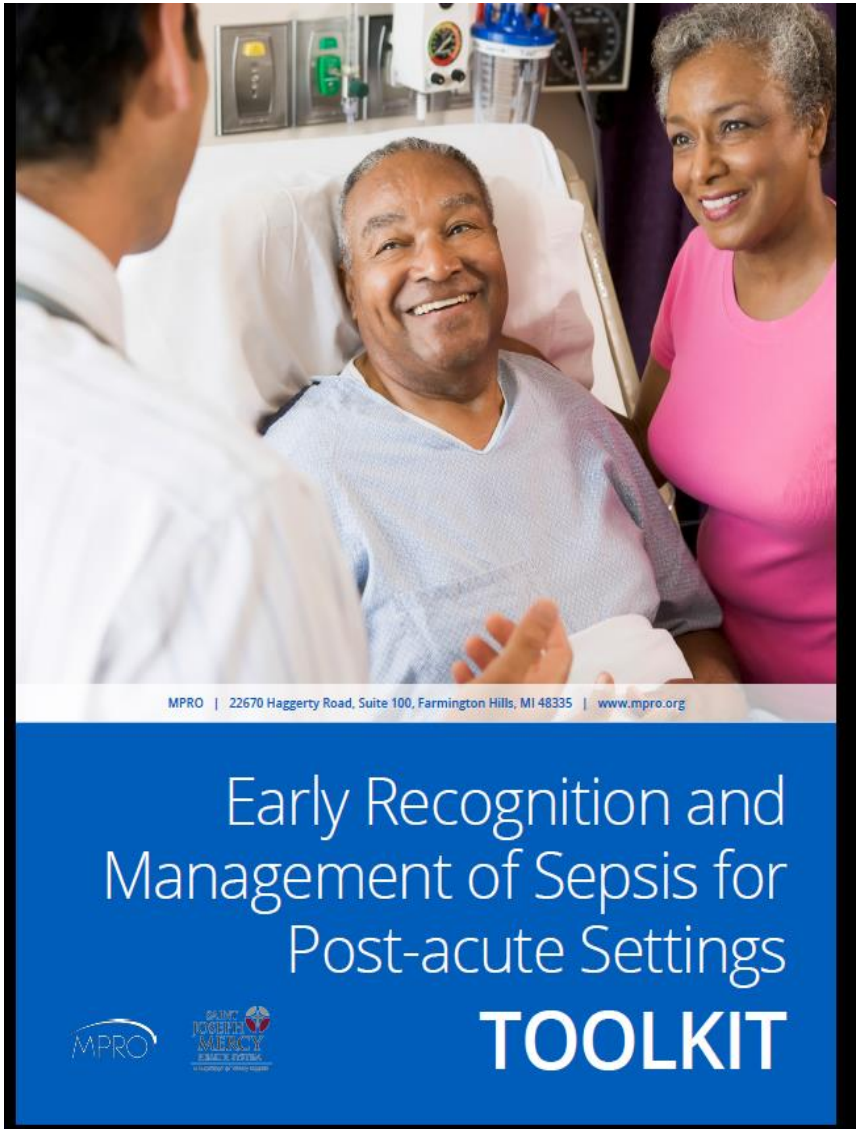

Table of Contents

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DATA

Data Collection

Complete process metrics monthly and submit

Working with MPRO on the outcome metrics

- Process metrics:
  - Percent screened— **most facilities are above 90%**
  - Percent screened correctly— **most facilities are above 90%**
  - If patient transferred to hospital for infection or sepsis:
    - Chart review-was patient screened appropriately and were the correct interventions completed
- Outcome Metrics
  - Unplanned readmissions to hospital
  - Mortality

Sepsis Readmissions and Mortality Rates

Gloria Pizzo, RN, BSN
Quality Program Manager, MPRO

Analytics Summary

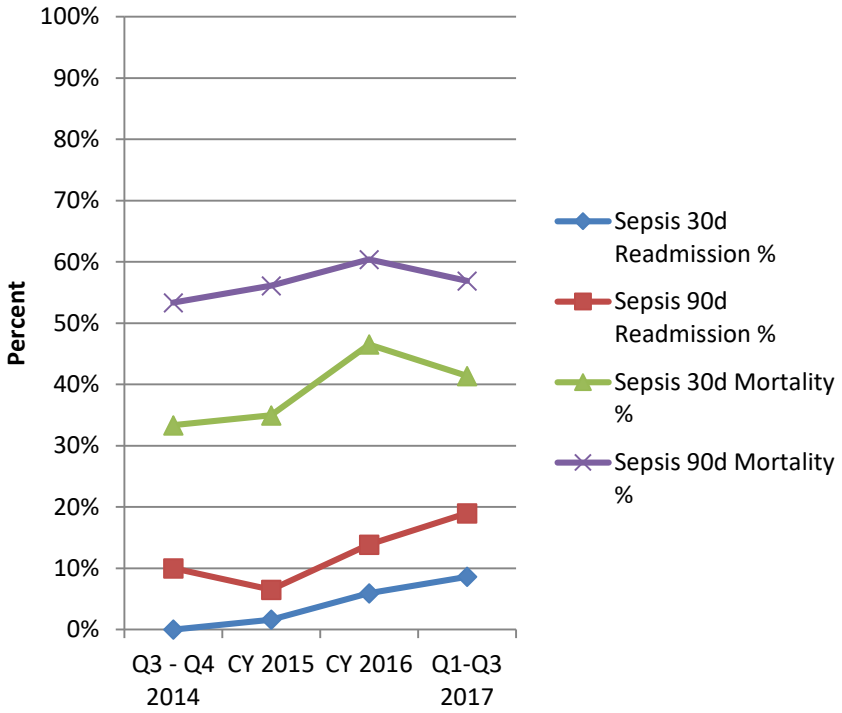
1. **Readmission rates for patients discharged with sepsis diagnosis**
   - 30 day all-cause
   - 90 day all-cause
2. **Mortality rates for patients discharged with sepsis diagnosis**
   - 30 day
   - 90 day

CSAT Processing

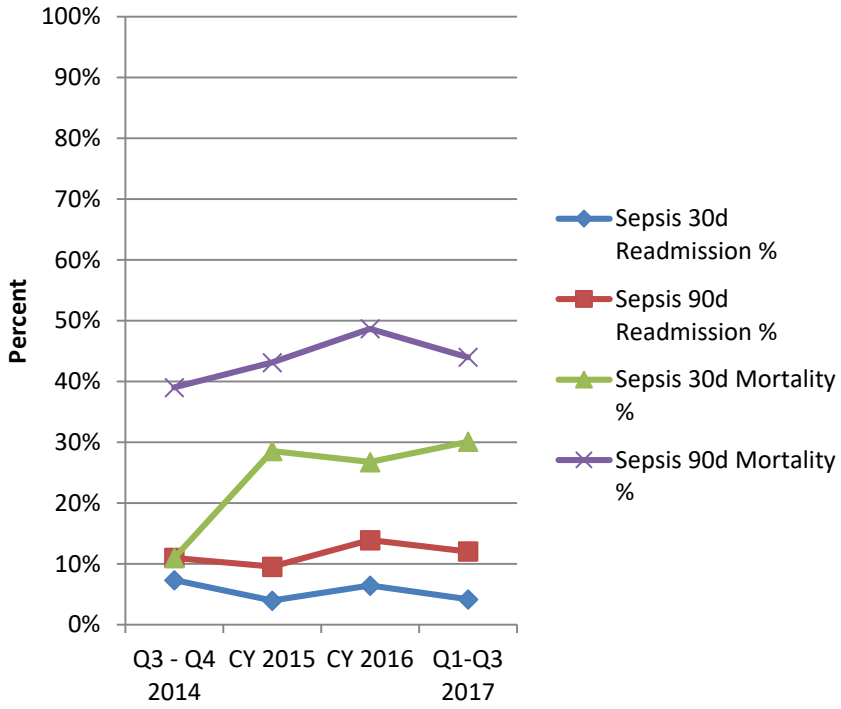
- **Lake Superior QIN CSAT processing**
  - 30d and 90d readmissions are flagged
    - Days between discharge and admission
  - Sepsis is flagged, among many other diseases
    - Per ICD9/10
- **Limit dataset to sepsis discharges**
  - Primary and secondary diagnosis
- **Limit to 2 hospitals**
  - St. Joseph Mercy Health System Ann Arbor
  - St. Joseph Mercy Health System Livingston

Results: SNF: 30-Day and 90-Day Readmission and Mortality Rates

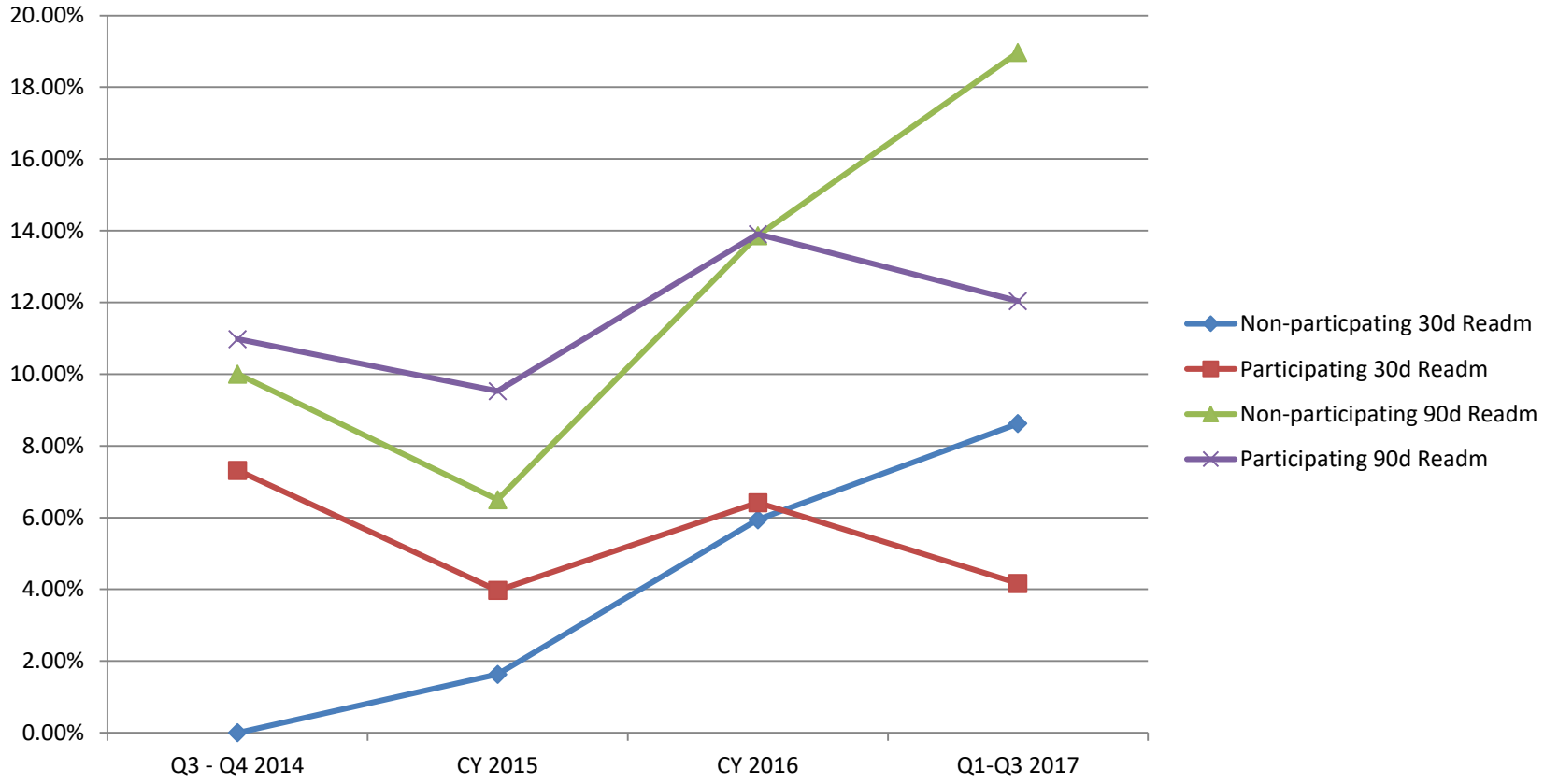
Nonparticipating SNFs: Readmission and Mortality



Participating SNFs: Readmission and Mortality



Results Combined: Participating and Nonparticipating SNFs: Readmission Rates



4 Key Element of Sepsis Quality Improvement Programs

- Leadership
- Data reporting and technology
- Evidence-based clinical protocols and integration of screening tools
- Frontline staff education

Conclusions

- Early Recognition and Management of Sepsis Program demonstrate:
- **Fewer sepsis readmission**
- **Reduces the costs of inpatient care**, stops the progression of sepsis along the trajectory to severe sepsis and septic shock and avoids associated morbidity and treatment costs.
- **Lower mortality rates**

Early Recognition and Management of Sepsis Programs for Post-Acute Settings

Four sepsis programs:

- **2018 winter-spring programs (3 concurrent)**
- **2018 summer-fall programs (2 concurrent)**
  - Each program has 5 consecutive monthly sessions with 2 sepsis educators/session from BH, HFHS, Trinity
  - Implement Early Recognition and Management of Sepsis for Post-Acute Settings Toolkit
  - Participation agreement
  - Sepsis screening audit

Learning

- **Must have support of facility administration**

  DON (or designee) must attend each meeting
- **Coaching calls help to clarify expectations, answer questions**
- **Provide as many tools and materials to make it easy for facilities**
- **Must have group meet face to face to increase engagement, networking and sharing**

Resources

RESOURCES

New jersey Sepsis Learning-Action Collaborative

www.njha.com/sepsis

Surviving Sepsis Campaign

http://www.survivingsepsis.org/Pages/default.aspx

Centers for Disease Control and Prevention – Sepsis

http://www.cdc.gov/sepsis/index.html

Centers for Disease Control and Prevention – Nursing Homes and Assisted Living Resources

http://www.cdc.gov/longtermcare/

Minnesota Hospital Association "Seeing Sepsis Long Term Care Resources"

http://www.mnhospitals.org/patient-safety/current-safety-quality-initiatives/severe-sepsis-and-septic-shock

American Hospital Association's Health Research and Educational Trust "Sepsis Resources"

http://www.hret-hen.org/index.php?option=com_phocadownload&view=category&id=370&Itemid=369

QUESTIONS?